Space Weather Forecast

Issued on Friday, 26 May 2023 at 13:26 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: R1/R2 radio blackouts Likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with one Moderate flare. This is was from a very small but also magnetically atypical sunspot region, with a likely twisted field. However this region is declining. The largest region is in the southeast disc, however this is a relatively simple east-west aligned bipolar region despite ongoing growth. The collection of three spot regions in the northeast continue to simplify and spread. The westernmost region is now the most likely flare source of these, as a small but compact bipolar spot. The middle one was historically the most active of these spots, but has now simplified to a more open bipolar structure. A further large, mature region is in the southwest disc, with associated smaller spots to the north fading. Finally, new but small region in the northeast recently emerged and continues to grow.

The Moderate flare also produced a weak and narrow CME (coronal mass ejection), that has been assessed as likely having an Earth directed component, albeit weak. Very limited impact is anticipated with its arrival late day 4 (29 May) or just after. No other Earth-directed CME's have been observed.

Solar Wind / Geomagnetic Activity: Solar wind parameters show the fast winds from a coronal hole easing. Speeds have eased from elevated levels of 600 km/s to be slightly elevated near 450 km/s. The total magnetic field strength was weak, with the north-south component weak and variable. Geomagnetic activity was Quiet to Unsettled (Kp1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is Likely to remain Moderate, with isolated M-class flares Likely and a Slight Chance of X-class flares. No sunspots leave the disc in the four days, while potentially new regions may rotate on from the far side. As these regions have yet to appear for analysis over the eastern limb, the potential risks of significant flares remain constant throughout the forecast period.

Solar Wind / Geomagnetic Activity: A weak CME from 22 May is expected to miss Earth day 1 or early day 2 (26 or 27 May), however a glancing influence cannot be ruled out as it passes. A further CME from 25 May is expected to arrive late on day 4 or just after (29 or 30 May), however this also a weak CME with only minimal observable impact currently anticipated. Otherwise current slightly elevated solar winds are expected to continue to very gradually ease, before the arrival of the next coronal hole fast wind, most likely on day 4 (29 May). Mainly Quiet geomagnetic activity is expected, with Unsettled intervals (Kp0-3). There is the potential for isolated Active (Kp4) spells and perhaps a slight chance of G1 Minor Storms (Kp5) day 1 or 2 (26 or 27 May) or more likely day 4 (29 May).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to be at background with solar radiation storms unlikely to occur.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	1	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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